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DEPARTMENT OF THE AIR FORCE

LAND MOBILE RADIO (LMR) NARROWBAND MIGRATION PLAN

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EXECUTIVE SUMMARY

The Air Force (AF) Narrowband Migration Plan implements the National Telecommunications and Information Administration (NTIA) mandate which requires all Federal operating agencies using wideband (25 kHz channel spacing) Land Mobile Radio (LMR) frequency assignments, within the United States and its Possessions (US&P), to migrate to narrowband (12.5 kHz channel spacing). The NTIA mandate does not apply to DoD radio equipment used for tactical and/or training operations or to AF operating locations outside US&P. The NTIA mandated migration completion dates for the affected bands are:

- 162-174 MHz, January 1, 2005
- 138-150.8 MHz, January 1, 2008
- 406.1-420 MHz, January 1, 2008

This plan includes guidance from the 1 Aug 2001 DepSecDef Policy for LMR Systems. The policy states new LMR radios or services procured after 1 Aug 2001 that operate within 380-399.9 MHz must be designed for narrowband operations. New LMR radios or services procured after 1 Aug 01 intended for use in the US&P shall comply with the APCO Project 25 standard. The policy letter also states that LMRs intended for use in locations outside US&P shall conform to host nation requirements. Also stated is that cryptographic security requirements depend on the application environment.

LMR assets are critical components of the global information grid and will continue to play a significant role in the total Personal Wireless Communications Systems (PWCS) architecture for AF communications for many years to come. Each major command (MAJCOM) delegates the authority to identify, prioritize, manage, and allocate the necessary resources for LMR communications to the base level. This is the preferred approach.

LMR replacement planning and/or upgrade actions have traditionally been addressed through year-end “fall-out” funding. The magnitude of the NTIA mandated LMR inventory change out prohibits accomplishment using traditional funding methods. Barring the receipt of adequate Program Objective Memorandum (POM) funds, internal re-prioritization of MAJCOM programs will be required to ensure the AF meets the mandated migration within the allotted time frame.

Alternative strategies for replacing government-owned infrastructure with commercially provided services/technologies are also addressed in this plan. The leveraging and integration of these commercial developments into the AF narrowband migration plan offer opportunities for AF organizations to take immediate advantage of their enhanced capabilities while reducing the initial equipment acquisition and near-to-mid-term operating costs.

There may be a high demand for LMRs as deadlines approach, therefore, equipment production and installation lead times must be considered. Using available government contract vehicles, such as GSA and Base Radio Systems, may be beneficial during the planning process.

This document is a tool by which AF upper-level management can monitor and provide input into the transition process and address required equipment replacement in terms of funding strategy, NTIA compliance time frames, narrowband channel assignment availability dates, and mission category priorities. MAJCOMs will provide their individual migration plans to the Air Force Communications Agency (AFCA) for inclusion in the annex to this document. AFCA will monitor MAJCOM migration status and provide AF/XI with a quarterly status report until complete.

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1.0. INTRODUCTION

1.1. The AF Narrowband Migration Plan implements the NTIA mandate requiring that all Federal radio systems operating in the 138-144, 148-150.8, 162-174 MHz, and 406.1-420 MHz bands, migrate to a new narrowband (12.5 kHz channel bandwidth) standard. The new NTIA standard further establishes that after 1 January 1995, any new system, and after 1 January 2005, all systems in the 162-174 MHz band must conform to narrowband requirements. Also, after 1 January 1995, any new system, and after 1 January 2008, all systems in the 406.1-420 MHz band must conform to narrowband requirements. And, after 1 January 1997, any new system, and after 1 January 2008, all systems in the 138-150.8 MHz band must conform to narrowband requirements. Additionally, although not specified in the NTIA Federal Mandate, per 1 Aug 2001 ASD policy memo, new LMR radios or services procured after 1 Aug 2001 that operate within 380-399.9 MHz must be designed for narrowband operations.

1.2. The NTIA mandate also states that these standards do not apply to military equipment used for tactical and/or training operations. For the purposes of this migration plan, “tactical” means used exclusively for combat environment or outside the US&P. “Training” means “major military exercises to simulate wartime operations” i.e. COPE THUNDER, ULCHI FOCUS LENS, etc. However, units must coordinate the use of wideband equipment for training through the appropriate spectrum manager(s), as the equipment will be used on a non-interference (NIB) basis.

1.3. Failure to comply with the NTIA narrowband mandate within the time frames specified can lead to directed shutdown of all noncompliant equipment.

1.4. LMR systems provide vital wireless communications capabilities to all AF MAJCOMs, direct reporting units, and field operating agencies. They enable military forces to quickly establish command control and other critical communications during both in-garrison training and deployed contingency operations. LMRs are critical components of the Global Information Grid (GIG) and will continue to play a significant role in the total AF.

1.5. This document provides a tool with which AF upper-level management can monitor and provide input into the transition process and address required equipment replacement in terms of funding strategy, NTIA compliance time frames, narrowband channel assignment availability dates, and mission category priorities.

2.0. FUNDING STRATEGY

2.1. Due to the magnitude of the NTIA narrowband mandate, the use of traditional funding strategies will not suffice. Prior to this mandate, each MAJCOM delegated the authority to identify, prioritize, manage, and allocate the necessary resources for LMR communications to the base level. The AF has determined that this level of management authority was the most effective for LMR services. The authorities, being the respective base commanders, manage resources appropriately to effectively accomplish the assigned missions.

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2.2. Funding for LMR replacement planning and/or upgrade actions, at the base level, has traditionally been addressed through year-end “fall-out” funding. It is anticipated that narrowband LMR requirements will need to be at least partially funded through the Program Objective Memorandum (POM) process, in order to meet the mandated deadlines.

2.3. For funding purposes, the following definitions are provided:

2.3.1. Mission Critical: Definition--Operations readiness or mission effectiveness. Any information, information system, or network that is vital to the operational readiness/mission effectiveness of deployed/contingency forces in terms of content/timeliness.

2.3.2. Mission Essential: Definition--Sustainment/indirect support. Any information, information system, or network that is important to the support of deployed/contingency forces.

2.3.3. Mission Support: Definition--Routine/day-to-day business. Any information, information system, or network that is necessary for the conduct of the day-to-day business of the Air Force. Does not materially affect support to the deployed forces or the readiness of contingency forces in the short term.

2.4. LMR Program: Although the ultimate responsibility for ensuring funds are available to complete the NTIA mandated migration to narrowband LMR remains with the MAJCOMs, AFCA successfully initiated a program action to establish an LMR funding strategy that combines the affected MAJCOMs’ LMR requirements under Global Information Grid advocacy. Following Air Staff guidance, the LMR Program POM strategy is to fund mission critical LMRs. AFCA will continue to advocate for available resources until funds are received and distributed, migration is completed, or otherwise directed by AF/XI.

2.5. Distribution: All LMR funds acquired by AFCA POM/APOM activities will be distributed to each MAJCOM by AF/ILSR through AF/FM. MAJCOMs will be responsible for appropriate procurement actions, IAW the migration priorities established within paragraph 3 of this plan.

Funds will be allocated to MAJCOMS for distribution and can only be spent to meet the mandate in accordance with the MAJCOM migration plan. Affected MAJCOM/SCs will submit quarterly reports to AFCA/GC on the status of purchases. Metrics will be developed based on MAJCOM migration plans and used to assess AF progress toward achieving deadlines for narrowband compliance of the NTIA Mandate. (Report format to be provided at a later date.)

3.0. IMPLEMENTATION STRATEGY

3.1. Infrastructure: Currently, AF LMR systems operate in the following bands: 138-144 MHz, 148-149.9 MHz, 150.05-150.8 MHz, 162 –174 MHz (VHF) and 406.1–420 MHz (UHF). Additionally, 380-399.9 MHz will be made available for LMR usage.

3.2. Baseline Narrowband Channel Plans: Under the proposed narrowband LMR channel plans, the number of frequencies available for assignment within the US&P will virtually double. Baseline narrowband channel plans for the VHF bands 138-150.8 MHz and 162-174 MHz and

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the UHF bands 380-399.9 MHz and 406.1-420 MHz are complete or near completion. Some are available for assignment action and use within the US&P.

3.2.1. LMR Band Performance And Operational Suitability Characteristics: Each of the bands has specific advantages and disadvantages that should be weighed carefully prior to MAJCOM and/or local commander decision to purchase LMRs or LMR infrastructure (Ref. table 3.1).

Notes applicable to all bands:

1. All bands subject to US-Mexico agreement to share frequencies along the border.
2. Use of the RF spectrum outside the US is subject to host nation agreements established between each country and the COCOM. For EUCOM spectrum supportability details, refer to EUCOM Spectrum Management Manual (VII)
4. Changing frequencies on trunked systems will likely require a local E3 assessment
5. Consult your spectrum manager for further details

Table 3.1*

Band	Advantages	Disadvantages
138-144 MHz 148 -149.9 MHz 150.05-150.8 MHz	<ul style="list-style-type: none">- DoD is Priority User- Some Wideband interoperability built in- May not require new local Electromagnetic Environmental Effects (E3) assessment- Offers some interoperability with systems in PACOM AOR (138-142 MHz)	<ul style="list-style-type: none">- Limited use along US/Canada border zone
162-174 MHz	<ul style="list-style-type: none">- Interoperable with other Federal Agencies to include Federal first responders	<ul style="list-style-type: none">- AF/AR is not Priority User- AF/AR limited to 24 Frequencies- Risk of losing frequency assignments upon 5-year periodic review- Channel plan is not trunked systems friendly- Channel plan currently under review
380-399.9 MHz	<ul style="list-style-type: none">- DoD is Priority User- Some Wideband interoperability built in- US&P wide DoD interoperability	<ul style="list-style-type: none">- Will require new local E3 assessment- Channel Plan development is ongoing
406.1-420 MHz	<ul style="list-style-type: none">- Interoperable with other Federal Agencies to include Federal first responders	<ul style="list-style-type: none">- DoD is not Priority User- DoD limited to 24 Pairs and 9 simplex channels- Risk of losing “borrowed” frequency assignments upon 5-year periodic review

3.3. Migration Priorities (Precedence Order) * *AFFMA will supplement this plan as required to accommodate frequency allocations*

3.3.1. MAJCOMS, FOAs, and DRUs shall adhere to the following migration precedence:

- AF Bases with wideband LMR systems operating within 100 miles of the Mexican border or 50 miles of the Canadian border
- AF Bases with wideband LMR systems operating in the 162-174 MHz band
- AF Bases located in areas of high-density spectrum versus those located in low-density spectrum use (e.g., Pope, or Langley before Grand Forks or Ellsworth)

Note 1: In areas with high population density, use of trunked LMR systems should be explored due to their inherent spectrum efficiency. Sharing trunked infrastructure can provide significant benefits while reducing infrastructure investment and may provide support in a joint use environment. Bases/installations should consider sharing infrastructure with other federal partners where feasible (Ref AFI 33-106 para A2.6.).

Note 2: Does not apply to tactical radios or non-tactical radios used exclusively outside US&P.

3.3.2. Assignment Process: Frequency assignments provide a license to operate RF emitting equipment. Assignments will be pursued in two phases. For planning purpose, “Planning assignments” will be used to “put down a marker” for use of spectrum. However, the planning assignment must be replaced by an operational frequency assignment prior to operating RF emitting equipment. The assignment process requires support from the Base, MAJCOM, and AFFMA.

Base/Installation: The installation spectrum manager initiates the frequency planning assignments.

MAJCOM: MAJCOM spectrum management will validate installation requirements and coordinate all MAJCOM narrowband planning and operational assignments for submission to AFFMA for national level coordination.

AFFMA: AFFMA will ensure the necessary coordination between other federal agencies is achieved to ensure a smooth, consistent, and scheduled migration accomplishment that minimizes the potential for disruption of services of and between all affected organizations.

3.4. Spectrum Reallocations: As the demand for RF spectrum continues to grow, so does the need to increase RF spectrum efficiency. Spectrum reallocation and an increase in LMR trunking are necessary to make fundamental increases and be employed in all LMR bands as a means to squeeze more efficiency from the available spectrum. Reallocations will be identified in the band use channelization plans. Bases/installations should consider sharing infrastructure with other federal partners where feasible (Ref AFI 33-106 para A2.6.). This along with other actions, such as negotiated spectrum usage agreements, should reduce spectrum shortages in geographical areas where current wideband allotments are insufficient.

3.5. Support for State and Local Government Interoperability Partnerships: The AF provides mutual aid assistance to nearby community, county, and state emergency services. Traditionally, this has been accomplished by either permitting the civil users direct access to our emergency service frequencies (i.e., fire, medical, law enforcement, etc.) or by obtaining permission from the FCC to communicate on their assigned civil frequencies. Bases with current “Mutual Aid” agreements with civil entities should consider APCO Project 25 interoperability and compatibility prior to migration.

3.6. MAJCOM Actions (Precedence Order):

3.6.1. Mandatory Preliminary Actions:

3.6.1.1. MAJCOMs will develop their own migration plan. Within 30 days of final approval of the AF plan, MAJCOMs are to submit a copy of their plan to AFCA for appending. Report format to be provided.

3.6.1.2. Until adequate numbers of JTRS or equivalent radios are available, retain a sufficient quantity of existing wideband LMR assets for use on missions for known Expeditionary Air Force (EAF)/Humanitarian Relief Operation (HUMRO) deployment requirements outside the US&P.

3.6.1.3. Affected MAJCOMs should evaluate operational suitability and risk associated with other alternatives such as commercial wireless devices and/or services to meet in-garrison wireless communications requirements prior to migrating all wideband LMR assets to narrowband.

3.6.1.3.1. Respective base commanders should target approximately thirty percent of existing wideband LMRs to be replaced with commercial PWCS alternatives (e.g., Intra-Squad Radios, one or two-way commercial pagers, Enhanced Specialized Mobile Radio (ESMR) or Cellular Telephone services). Commanders should be aware of associated risks in using commercial services such as overload during emergencies and peak operating times (ref AFI 33-106 para 4.9.).

3.6.1.4. Consider encryption requirements in accordance with AFI 33-201 (COMSEC) and other applicable guidance. The 1 Aug 2001 DepSecDef Policy for LMR Systems states that non-tactical LMRs likely to be used for communicating classified information shall meet high robustness requirements with NSA-approved security capability. Non-tactical LMRs likely to be used for communicating Sensitive But Unclassified (SBU) information shall meet minimum or basic robustness, depending on the application environment.

3.6.2. Mandatory Quarterly Actions:

3.6.2.1. At the end of each quarter, MAJCOMs will consolidate and report the commands current status on narrowband migration compliance to AFCA/GC.

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3.6.2.2. During the first week of each quarter, AFCA will consolidate MAJCOM inputs to determine the overall AF-migration status, and forward a report to AF/XI and AF/IL for review until migration is complete.

3.6.3. Required Annual Actions:

3.6.3.1. Each MAJCOM should submit any remaining validated but unfunded conventional or trunked LMR wideband-to-narrowband equipment migration requirements through their POM/APOM process for funding consideration.

3.6.3.2. Wherever possible, all available MAJCOM discretionary financial resources should be prioritized and targeted for replacement of qualifying wideband LMR assets.

3.6.3.3. Ensure the PWCS Tracking and Reporting Software (TRS) database information is updated annually (July), at both wing/base and MAJCOM levels, in accordance with AFI 33-106, dated 9 Jan 02, or its successor. MAJCOMs may want to mandate quarterly base TRS exports to assist in tracking narrowband migration status.

3.6.4. AFCA/MAJCOM Funds Transfer Actions: (See paragraph 2.5 “Distribution”)

3.6.5. Mandatory Pre-deadline Year Actions:

3.6.5.1. If funds for replacement of qualifying wideband LMR assets have not been obtained through the POM process by 1 September 2003 and 1 September 2006, respectively, internal re-prioritization of MAJCOM programs may be required to ensure the AF is able to meet the mandated migration within the allotted time frame.

3.6.5.2. MAJCOM/SCs should establish a “Narrowband LMR Contingency Plan” which outlines procedures for reallocating narrowband assets within the command. Use specific redistribution priorities to ensure known operational mission requirements are met.

3.6.5.3. Priorities with less than a “mission failure” impact should only be addressed if the available command narrowband LMR assets exceed the number required for satisfactory mission accomplishment.

3.6.5.4. The following prioritization categories are recommended:

3.6.5.4.1. Critical – Mission Failure

- Operational Command and Control
- Fire/Crash/EOD services
- Security (Law Enforcement)
- Disaster response/Emergency medical services
- Airfield Security
- Flightline Launch/Recovery operations

3.6.5.4.2. Essential – Mission Failure

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- Logistics (Maintenance/Transportation/Supply services)
- Support (Communications, Computer systems, and Civil Engineering minus Fire/Crash/EOD)

3.6.5.4.3. Support – Mission Failure

- Services Support (Finance/Food Service/Recreation/Family)
- Mission Support (Military/Civilian Personnel, Education, etc.)

4.0. ACQUISITION STRATEGY

4.1. There may be a surge in demand for LMR purchases and installations as the deadlines approach, therefore, equipment production/installation lead times must be considered in the process. Suggest using available government contract vehicles, such as GSA and Base Radio Systems, that provide requirements analysis and tailored LMR solutions for your acquisitions.

4.2. BASE RADIO SYSTEMS (BRS) PROGRAM

<http://www.monmouth.army.mil/smc/brs/overview.htm>

4.2.1. The BRS program is available to all DoD and Federal agencies worldwide and will allow Government Agencies to access technically qualified vendors for LMR products and services that comply with DoD Guidance and the NTIA narrowband mandate.

4.2.2. The BRS program offers commercial radio technology, products, and services. These offerings will allow customers to acquire tailored solutions to their specific LMR requirements. Offerings include categories for LMR systems from full turn-key to equipment, site preparation, technical support services, O&M, and system design and analysis.

4.2.3. The BRS Management Office (BMO) will assist the BRS process and program. The BMO Team is staffed with Project Officers experienced in procuring LMR systems, their design, maintenance, and management.

5.0. SUMMARY

5.1. This plan provides a road map for AF implementation of the NTIA mandated LMR narrowband migration.

5.2. AFFMA will ensure the new AF narrowband channel allotment plans make provision for the assignment of adequate emergency service channels to permit state, local, and Federal mutual aid assistance, as necessary. AFFMA will continue to address all required channel-sharing issues between the AF and other DoD/non-DoD federal departments/agencies and affected foreign nations.

5.3. Affected MAJCOM commanders must ensure their wing/base/unit wideband LMR users migrate to either a new narrowband LMR assignment or an alternative technical solution within

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the NTIA mandated time frames. MAJCOMs should evaluate available commercial wireless devices and/or services for their ability to meet in-garrison non-tactical wireless communications requirements, as alternatives.

5.4. All mission critical LMR requirements should be forwarded to AFCA to be included in the overall POM input. Each MAJCOM will be responsible for ensuring non-critical requirements are in the POM/APOM. Wherever possible, all available MAJCOM discretionary financial resources (e.g., fall-out) should be prioritized and targeted for replacement of qualifying wideband LMR assets.

5.5. Affected MAJCOM and wing/base/unit funding priorities for wideband equipment replacement must initially target assets in the 162-174 MHz band.

5.6. Wideband LMR nets that have not completed migration by the mandated narrowband implementation dates will lose the right to radiate RF and will be required to cease operating as of those dates.

5.7. As the deadlines approach, consideration should be given to a potentially high manufacturer production backlog and/or installation lead-time. If funds for replacement of qualifying wideband LMR assets have not been obtained by 1 September 2003 and 1 September 2006, respectively, internal reprioritization of MAJCOM programs will be required to ensure the AF meets the mandated migration dates. Government contract vehicles such as GSA or BRS should be used.

5.8. MAJCOM's and AFCA will monitor progress and provide AF/IL and AF/XI with a quarterly status report until complete.